

# **Ocean Engineering Technical Data Sheet**

## **(TD 95-01, Rev. May 1999)**

### **SOLAR AID CONTROLLER II (SACII) BENCH CHECKOUT PROCEDURE**

#### **1. INTRODUCTION**

This procedure is designed to bench test a questionable SACII, hereafter referred to as the controller, and determine whether it can be returned to service. This test is valid only for controllers maintaining the original factory current threshold setting (i.e., if the label on the top of the controller has been peeled back, torn, or punctured exposing the trimmer potentiometer screw, the current threshold has probably been changed). However, since some applications require changing the current threshold, you may have a controller with a readjusted threshold. Please contact equipment manager at COMDT (G-SEC-2A) for guidance on bench testing controllers with altered current threshold settings.

#### **2. EQUIPMENT REQUIRED**

- Digital Multimeter, Fluke 77 or 87, or equivalent;
- 12-volt, 3-amp (or greater) regulated DC power supply;
- or • 12-volt, 100AH solar battery charged to at least 12.8VDC VOC (open circuit voltage);
- 2.03-amp, 12-volt DC marine signal lamp (one each);
- 0.25-amp, 12-volt DC marine signal lamp (one each);
- CG-6P lampchanger (two each);
- 100K-ohm resistor, ¼-watt or larger (four each); and
- Hookup wire and/or alligator clip leads.

#### **3. PROCEDURE**

Read each step of the procedure completely before performing it. Place a check mark in the space provided next to the letter after successfully completing the step.

- \_\_\_ a. With the digital multimeter in the resistance setting, verify that the four 100K-ohm resistors are within 10% of rated value (90K to 110K-ohms).
- \_\_\_ b. With the digital multimeter in the continuity setting, verify that both lamps are good by ensuring electrical continuity between the lamp's base and post.
- \_\_\_ c. Ensure switch S1 (on the controller) is in position "1" and that a wire jumper (J1) is installed between terminals TB1-2 and TB1-3.
- \_\_\_ d. Using hookup wire, interconnect the two CG-6P lampchangers and the controller as shown in Figure 1. Do not make power supply (or battery) interconnections yet. Power supply (or battery) interconnections will be made in steps (e) and (i) below.
- \_\_\_ e. Connect the four 100K-ohm resistors to the controller and power supply (or battery) as shown in Figure 1.
- \_\_\_ f. Rotate the lampchangers' turrets clockwise to their first positions (painted red) and install the two lamps. The 2.03-amp lamp must be installed in lampchanger #2 (lampchanger #2 has the F-terminal connection to the controller).
- \_\_\_ g. Using additional hookup wire, install a wire jumper (J2) between TB1-5 and TB2-2.

- \_\_\_ h. If using a power supply, switch it on, adjust its output to 12VDC  $\pm$ 0.1VDC, and double check the output voltage with the multimeter.
- \_\_\_ i. Apply power from either the power supply or the battery to the controller at TB1-1 (+) and TB2-2 (-). Also, apply positive (+) power to the lampchangers' "L" terminals, as shown in Figure 1.
- \_\_\_ j. Ensure that **all** connections are tight and secure.
- \_\_\_ k. With the digital multimeter in the DC-Voltage setting, ensure the indicated voltages are present at the following four terminals (negative side of the multimeter must be connected to either TB2-2 terminal of the controller **or** the power supply negative or battery negative terminals, whichever the case may be):
 

TB1-7	between 0.0VDC and 1.0VDC ( <b>0.0 - 1.0VDC</b> )
TB1-8	greater than 11.0VDC ( <b>&gt;11.0VDC</b> )
TB1-9	greater than 11.0VDC ( <b>&gt;11.0VDC</b> )
TB1-10	greater than 11.0VDC ( <b>&gt;11.0VDC</b> )
- \_\_\_ l. Disconnect wire jumper J2 from TB1-5 (but do not disconnect from TB2-2 and be **VERY CAREFUL** not to let disconnected end accidentally touch any other terminal) and ensure both lamps turn on.
- \_\_\_ m. With the digital multimeter in the DC-Voltage setting, ensure the following is true:
 

TB1-7	<b>0.0 - 1.0VDC</b>
TB1-8	<b>0.0 - 1.0VDC</b>
TB1-9	<b>&gt;11.0VDC</b>
TB1-10	<b>&gt;11.0VDC</b>
- \_\_\_ n. Ensure both lamps have remained on even after a full two minutes have elapsed.
- \_\_\_ o. Manually advance the turret of lampchanger #2 to the second position by twisting the circular solenoid plate clockwise until it ratchets, release it, and ensure that, after a slight delay, the turret systematically advances to the sixth and final position and continues attempting to ratchet there until the 0.25-amp lamp turns off in 80 to 120 seconds (100 seconds nominal). This 100-second timing cycle starts simultaneously with the twisting of the solenoid plate. The 2.03-amp lamp will turn off immediately as it rotates out of position. **CAUTION:** THE LAMPS MAY BE **HOT!**
- \_\_\_ p. With the digital multimeter in the DC-Voltage setting, ensure the following is true:
 

TB1-7	<b>&gt;11.0VDC</b>
TB1-8	<b>&gt;11.0VDC</b>
TB1-9	<b>0.0 - 1.0VDC</b>
TB1-10	<b>0.0 - 1.0VDC</b>
- \_\_\_ q. Carefully reconnect the disconnected end of wire jumper J2 to TB1-5. **CAUTION:** Do not allow the disconnected end of J2 to accidentally come in contact with any of the other terminals, especially TB1-6, while reconnecting to TB1-5. If inadvertent contact with TB1-6 is made, reconnect disconnected end of J2 to TB1-5 and start the test over again at step k.
- \_\_\_ r. With the digital multimeter in the DC-Voltage setting, ensure the following is true:
 

TB1-7	<b>&gt;11.0VDC</b>
TB1-8	<b>&gt;11.0VDC</b>
TB1-9	<b>0.0 - 1.0VDC</b>
TB1-10	<b>&gt;11.0VDC</b>
- \_\_\_ s. Once again, disconnect wire jumper J2 from TB1-5. However, as before, don't disconnect it from TB2-2.

- \_\_\_ t. Manually rotate the turret of lampchanger #2 clockwise all the way back to the first position.
- \_\_\_ u. Momentarily touch the disconnected end of wire jumper J2 to terminal TB1-6 to reset the controller but do not connect it anywhere after the reset. Ensure both lamps turn on once again.
- \_\_\_ v. Disconnect wire jumper J1 (between TB1-2 and TB1-3) at either end and ensure both lamps turn off in 80 to 120 seconds (100 seconds nominal). End of test.

4. FINDINGS

If the controller passes all steps of the bench checkout procedure above, it is not defective and can be returned to service or saved as a spare. If the controller fails one or more steps, please indicate where the problem(s) occurred and any other observations and send this test data sheet with your comments to COMDT (G-SEC-2A) along with the defective controller. Please use the space below for your comments, observations, notes, etc.

K. AGI  
COMDT (G-SEC-2A)  
TEL: (202) 267-1872  
e-MAIL: [kagi@comdt.uscg.mil](mailto:kagi@comdt.uscg.mil)  
REV. 5/99

**Comments:**

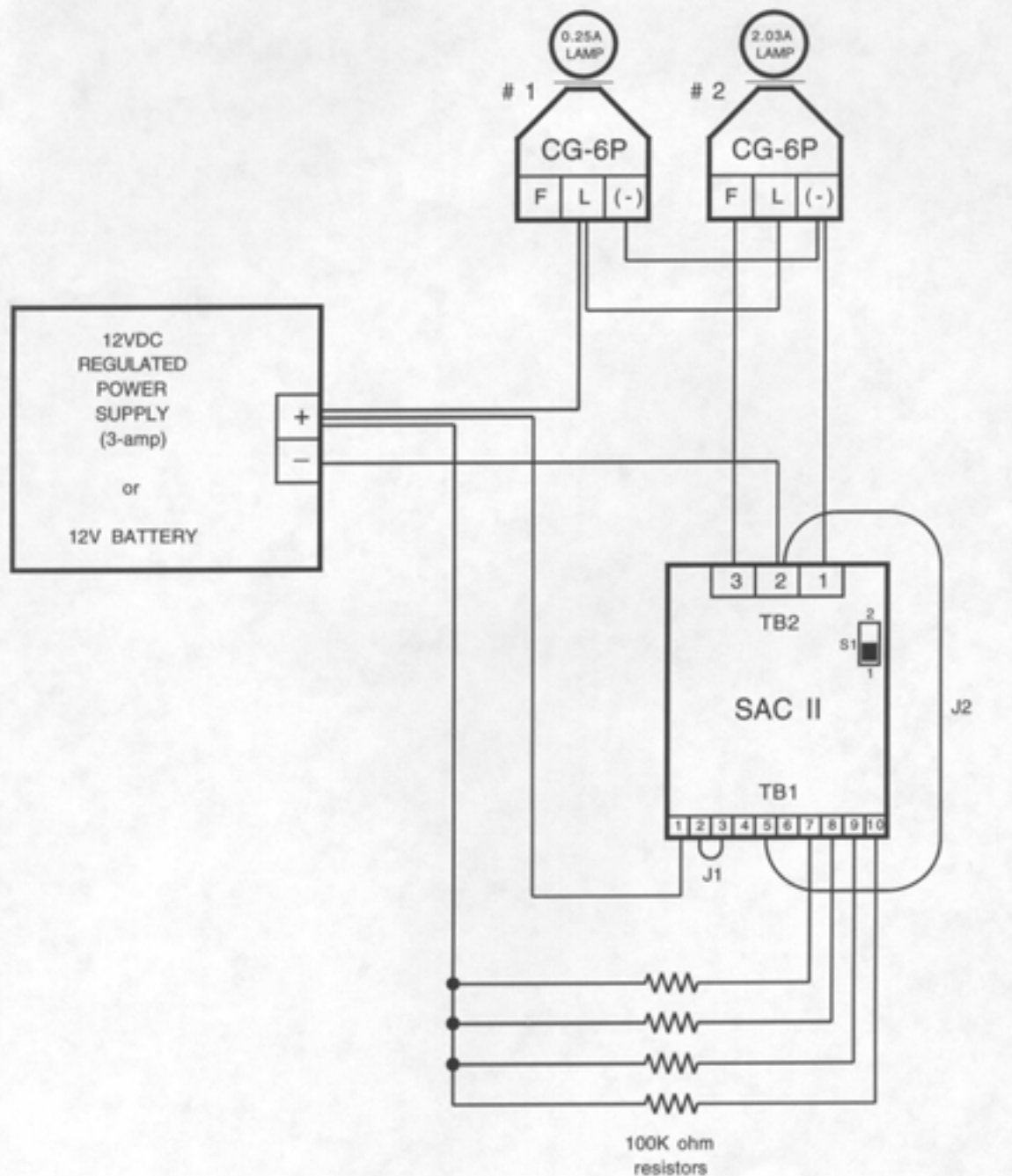


FIGURE 1.

# SAC II BENCH CHECKOUT TEST DIAGRAM